

3 Interpreting Population Pyramids

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2 **Subject Area** Geography

3 **Suggested Level** Years 9-10

4 **Overview**

The activity explores changes to the structure of Australia's population over time and how this is reflected in the shape of the population pyramid. The implications of an ageing population in Australia are raised. Comparison between countries enables students to develop a theory based upon the shape of population pyramids.

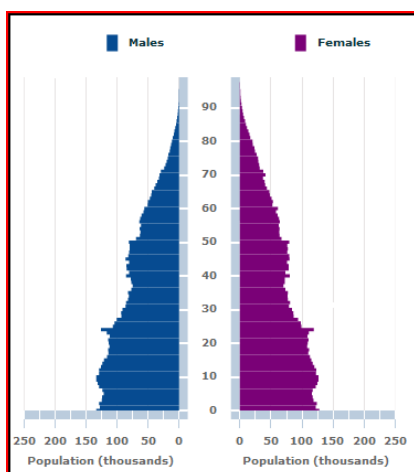
5 Requirements

- Computer
- To view the dynamic population pyramids on the ABS website you may need to install the free plug in '[Adobe Flash Player](#)' on your computer.

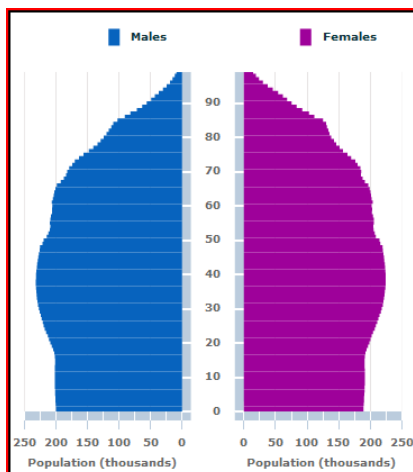
5.1 Task One: How Does the Australian Population Pyramid change over time?

Review the concept of population structure with the students (see GEO_07). Explore the changes to Australia's population structure from 1971 to 2056 using the [animated population pyramids](#) on the Australian Bureau of Statistics website.

1. Students create two labelled sketches of the Australian population pyramid in 1971 and the projected shape of the pyramid in 2056.



Sketch of Pyramid in 1971



Sketch of Pyramid in 2056

5.2 Task Two: Interpreting Population Pyramids



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2. Students consider why the term 'population profile' is often preferred to the term 'population pyramid'.

Answer:

The term pyramid describes a three dimensional shape whereas the diagram is two dimensional. The use of the term pyramid supposes a shape with a wide base and a narrow top, which is more typical of less economically developed countries or industrialised countries in earlier periods.

3. Ask students to work in small groups and brainstorm reasons for the changing shape of the population pyramid for Australia between 1971 and 2056.

Answer:

Social factors include high infant mortality rates, large families, risk of death during pregnancy affecting women of child bearing age, pandemics, improved public health e.g. widespread vaccination programs, loss of men of marriageable age because of wars, longer life expectancy, availability of contraception after 1971, education of women and their return to the workforce, decreasing fertility rates.

Economic factors; recession may lead to declining birth rates

Historical factors; wars leads to loss of young men, post war baby booms occur as people rush to have families after the disruption of war.

4. Ask students to respond to the following:

'With reference to the Australian population pyramids of 1971, the present year and 2056, describe and explain the changing shape of the Australian population pyramid.

Answer:

Australian population grows through natural increase (births > deaths) and net overseas migration. A selection of the following may be identified:

1971 - Population of 13 million. Post war I and II baby booms (especially those born 1945 - 48) evident and contributed to a young population for Australia, this large group accentuates the lower proportions in the age group above, post war influx migrants in all age-sex groups, number of older people increasing with but these are outnumbered by baby boomers. The depression of 1930s, introduction of contraception leading to smaller family size and spacing births, wide base showing higher fertility or migration rates may be found.



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Current year –Population of approximately 22 million declining fertility rates, life expectancy rising, women live longer than men, but gradually male life expectancy improves, Look for the baby boom echo effect, where a large cohort of babies, provides a large cohort of women of child bearing age, declining fertility rates are evident as base of profile gets narrower, Declining fertility rates in 1990s. Baby boomers echo effect – their children and grandchildren

2056 –Population of 35 million, swelling of middle and older age groups, lower fertility rates, longer life expectancy and imbalance in sexes with age.

5. Define the meaning of the term 'baby boomers'. What ages were these people in 1971? Identify how this group changes on the population pyramid between 1971 and 2056.

Answer:

Baby boom refers to the generation born between the end of World War II and the mid-1960s. Baby boomers are usually taken to be those born in the years 1946 to 1965 inclusive. Between 1971 and 2056, baby boomers create a bulge on the pyramid, which rises up the pyramid as the people age and then reduces in size as people die. Women will outnumber men in later stages

6. Discuss the implications for Australia of an ageing society.

Answer:

There will be a need for more health care workers, disability requirements, loss of experience in workforce, cost of servicing the aged, a declining number of tax payers to fund needs of elderly, adjustments in housing style will be required, increase in the active elderly, a change in the age for retirement is possible, there will be a need to provide for retirement through superannuation needs.

7. Social, historical, environmental, economic and political circumstances of an area will affect the demographic characteristics of a population and hence its population pyramid or profile. Test the understanding of students by asking them to sketch a pyramid for the following locations:

- 7.1 A coastal town with a large number of retirees.
- 7.2 A rural area where many young people have left to undertake tertiary studies.
- 7.3 A small town with a tertiary institution.
- 7.4 A region devastated by war.
- 7.5 A mining town with an influx of young males.

Answer:

Coastal town – broader sections post age 60- 65,



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Rural area – young 18 -29 left for studies in other centres

Tertiary institution – wider section in 18 – 25/29 age groups

War – loss of young men – 16 – 30

Mining town – higher proportion of males than females especially in 20-40 age groups.

5.3 Task Three: Developing a Theory

8. Ask students to explain their understanding of the terms ‘economically developed’ and ‘economically less developed’ country’ and provide several examples of each.

Economically developed countries experience high levels of economic development where there are low birth, death, and infant mortality rates, less than 10% of the workforce in agriculture; and high levels of nutrition, secondary schooling, literacy, electricity consumption per head, and GDP per capita.

Economically less developed are countries are the reverse of the above.

9. Ask students to hypothesise what they expect a population pyramid to look like for both ‘economically developed’ and ‘less economically developed’ countries.

Economically developed - narrow base and wider middle and top, with convex sides.

Less economically developed countries – wide base and narrow top with concave sides and a more typical triangular or pyramid shape.

10. Working in groups, ask students to research the population pyramids or profiles from a selection of economically developed and less economically developed countries using the [US Census Bureau International Data Base \(IDB\)](https://data.census.gov/tables//international/) website. Select Data> International Data Base > Country > Year > Population pyramid for chosen countries.
11. Ask students to determine if their hypothesis is correct and provide appropriate supporting evidence.

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Extension

7.1 Demographic Transition Model

1. The Demographic Transition Model illustrates how birth rates and death rates, and as a result, population structure change as countries develop from pre-



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industrial to an industrial economy. Locate a diagram to illustrate demographic transition.

2. China is a country which, partly as a result of its population policy, has undergone rapid demographic transition. Using the [US Census Bureau International Data Base \(IDB\)](#) website, and annotated thumb nail sketches of the China pyramid in 1990, 2000 and 2010 show how China illustrates demographic transition.

7.2 Dependency Ratio

1. Calculate the ratio of economically inactive to economically active population to establish the dependency ratio for Australia in 1971 and 2056. (See Glossary).
2. How does the ratio for Australia change over time?
3. Compare the dependency ratios for selected economically developed and economically less developed countries?

8 Glossary

Ageing of the population

Ageing of the population is the consideration of the proportion of the population aged 65 years and over, and the way this proportion is continuing to increase, mostly due to persistent low fertility rates and declining mortality rates.

Baby boom

Baby boom refers to the generation born between the end of World War II and the mid-1960s. Baby boomers are usually taken to be those born in the years 1946 to 1965 inclusive.

Crude birth rate

The crude birth rate is the number of live births registered during the calendar year per 1,000 estimated resident population at 30 June of that year.

Crude death rate

The crude death rate is the number of deaths registered during the calendar year per 1,000 estimated resident population at 30 June.

Dependency ratio

Dependency ratio is the ratio of the dependent population (aged 0-14 years and 65 years and over) to persons of working age (15-64 years), usually expressed as a percentage.

Life expectancy

Life expectancy refers to the average number of additional years a person of a given age and sex might expect to live if the age-specific death rates of the given period continued throughout his/her lifetime.

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11 References

(Note: Links to ABS publications are to the most recent release. Previous releases can be accessed by selecting the 'Past & Future Releases' tab.)



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Australian Bureau of Statistics, Population Clock

[http://www.abs.gov.au/AUSSTATS/abs@.nsf/Web+Pages/Population+Clock?
opendocument?utm_id=PC](http://www.abs.gov.au/AUSSTATS/abs@.nsf/Web+Pages/Population+Clock?opendocument?utm_id=PC)

US Census Bureau International Data Base (IDB),

<http://www.census.gov/ipc/www/idb/index.php>

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14 Feedback

To provide any feedback regarding this activity, please contact ABS Education Services on 1800 623 273 or email education@abs.gov.au.